



Proposed Revisions to 314 CMR 4.00: Massachusetts Surface Water Quality Standards Regulation

Recreational Bacteria Criteria Update

MassDEP Proposes to Adopt EPA's 2012 Recommended Bacteria Criteria Protective of Recreational Uses

Background and Reason for Change

The purpose of the 314 CMR 4.00: Massachusetts Surface Water Quality Standards (SWQS) regulation is to restore, enhance, and protect the chemical, physical, and biological integrity of surface waters in Massachusetts. The SWQS were adopted to designate the most sensitive uses for which surface waters are to be regulated, prescribe the minimum water quality criteria required to sustain those uses, restore waters to those uses, and maintain high quality waters.

The Federal Water Pollution Control Act, 33 USC §1251, et seq. (known as the Clean Water Act or CWA) and associated federal Water Quality Standards, 40 CFR Part 131, require the U.S. Environmental Protection Agency (EPA) to periodically publish updated or new recommended ambient water quality criteria (AWQC). The CWA and these federal regulations also require states to periodically review and, as appropriate, to update the AWQC they have adopted in State regulations. Each State has the option of either adopting the federally recommended criteria or developing its own criteria, subject to EPA review and approval. EPA may also promulgate criteria for a State that develops criteria that are not protective or that neither adopts EPA's recommended criteria nor develops its own.

EPA Guidance

In 2012, EPA released updated human health bacteria criteria recommendations for all waters designated for primary contact recreational uses such as bathing. For States' water quality standards, the EPA recommends criteria (i.e., geometric mean or "geomean" thresholds) for both *Escherichia coli* (*E. coli*) and enterococci bacteria for fresh waters, and enterococci bacteria for marine waters. EPA recommends these thresholds be combined with statistical threshold values (STVs) that are not to be exceeded by more than 10% of samples. Optionally, States can use "do-not-exceed" maximum bacteria levels called "Beach Action Values" or BAVs that are precautionary values used to notify beachgoers of potential harmful levels of bacteria. MassDEP's proposed updates to the bacteria criteria for Classes A, B, SA, and SB are consistent with the 2012 Federal Guidance.

Proposed Revisions

MassDEP proposes to adopt EPA's recommended geomean criteria that are protective of human health at a rate of 36 illnesses per 1,000 persons. MassDEP also proposes to adopt the STVs as outlined in Inset #1 (see page two of the fact sheet). These STVs will replace the existing single-sample maximum criteria. In addition, under

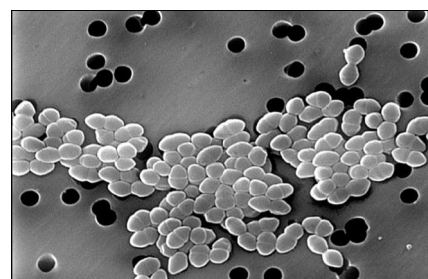


***Escherichia Coli* (*E. coli*)**

Photo: <https://health.clevelandclinic.org/How-to-Cut-Your-Risk-of-E.Coli-Poisoning>

Spotlight

For States' water quality standards, EPA's 2012 recommended criteria for pathogens include *Escherichia coli* (*E. coli*) and enterococci bacteria for fresh waters, and enterococci bacteria for marine waters.



Enterococcus faecalis

Photo Credit: Janice Haney Carr.
Content Providers: the Centers for Disease Control (CDC) and Prevention's Public Health Image Library (PHIL), with identification number #266.

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Recreational Bacteria Criteria (cont.)

these revisions the time period over which the bacteria levels are averaged to compare to the relevant criteria has been shortened and the sample minimum has been eliminated (see Inset #2 below).

Inset #1: Geometric Mean Criteria and Statistical Threshold Values

- ⇒ **The enterococci geometric mean criterion** in marine and fresh water **will increase from 33 to 35 colony-forming units per 100 milliliters (cfu/mL)****, and **the *E. coli* geometric mean criterion** in fresh water **will remain unchanged at 126 cfu/mL**.
- ⇒ **The existing single-sample maximums (235 cfu/mL for *E. coli* & 61 cfu/mL for enterococci in fresh water and 104 cfu/mL for enterococci in coastal and marine waters) will be replaced with the following Statistical Threshold Values** which must not be exceeded by more than 10% of samples:
 - ◇ **410 cfu/mL** for *E. coli* in fresh water; and
 - ◇ **130 cfu/mL** for enterococci bacteria in marine and fresh water.

**The enterococci criterion magnitude change from 33 to 35 cfu/mL is not considered significant and will ensure consistency with EPA's 2012 guidance.

Inset #2: Changes in Geometric Mean Evaluation Period

- ⇒ **For bathing waters during the "bathing season"** the calculation of the geometric mean will change from "the bathing season" to "a 30-day or smaller interval" (applies to bathing beaches, and CSO-discharge- and POTW-impacted areas),
- ⇒ **For bathing waters during the non-bathing season and all other waters** the 6-month averaging period will be reduced to 90 days, and
- ⇒ **The minimum requirement of 5 samples has been eliminated** to ensure consistency with EPA guidelines. The fewer samples taken, the more likely it is that each sample will have to meet the criteria.

Coordination with the Massachusetts Department of Public Health (MDPH)

MDPH makes beach closure decisions based on exceedances of geometric thresholds combined with single-sample maximum values for levels of *E. coli* and enterococci bacteria. At least weekly sampling is required at beaches during the bathing season (see MDPH's Minimum Standards for Bathing Beaches (105 CMR 445.031)). MassDEP assesses the quality of surface waters over the long-term for primary recreation as required by CWA sections 305(a) and 303(d), but does not make beach closure decisions. MassDEP has coordinated with MDPH on the proposed revisions to the SWQS.

Regulatory Implications

The regulation revises the bacteria thresholds that are used for assessing water quality for recreational uses. Applying the STV will be similar to applying a single-sample maximum when fewer than 10 samples are collected over the applicable time period. The STV is a higher value than the previous single-sample maximums; however, because of the shorter rolling averaging period, the STV will likely result in more criteria exceedances than the single-sample maximum (which is instantaneous) because a high bacteria value would influence multiple averaging periods. The proposed regulation does not specify a minimum number of samples required before taking the geometric mean, rather the criteria method applies no matter how many samples are collected. This process results in a more stringent framework as the number of samples decreases, because it becomes more likely that every sample will have to meet the criteria. The proposed changes will not affect how MDPH determines beach closures.

For more information on EPA's 2012 updated human health bacteria criteria recommendations, see <https://www.epa.gov/wqc/2012-recreational-water-quality-criteria>

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